tion, we ought to make further advances toward ideal speech. All such advances will serve English well in the struggle for adoption as the world-language, for the more cosmopolitan, the less grammatical, in the classical sense, must it be.

It needed no prophet to foretell the fate of Latin as a would-be international tongue. In the nature of the case, it could never be more than the artificially propagated and sustained speech of more or less extensive and widely scattered societies, cliques, clubs and associations (political, religious, scientific, etc.), for the mind of the Aryan and Semitic races was capable of something higher than speaking through a death-mask, and other populous nations have also to be reckoned with—nations like the Chinese, Japanese, Malays, Hindus—who cannot be expected to welcome a dead language over against a live one. Evolution, too, has written a like epitaph over Greek, which some enthusiasts would fain have us accept as a universal language. No such backward step is probable or even possible. Against all competitors in the field, English is favored by its increasing degrammatization and the open hospitality it extends to new words from every language under heaven.

Phonetic spelling must triumph in the end, and as complete a victory waits also for free speaking and free writing—*i. e.*, language untrammeled by grammatical artificialities. Not a backward-looking Volapük, but English with its face to the future foreshadows the true world-language. Phonetic spelling has already made a good beginning, which suggests the possibility of similar intentional reforms in English grammar. The present writer will content himself with specifying certain ameliorations of grammar, which, perhaps, may serve, like the ten 'rules' for amended spelling proposed in 1883 by the English and American Philological Associations, or the list reported by the American Committee in 1886, as starters for more ambitious movements of reform.

The list is as follows:

1. Drop the so-called *subjunctive mood* altogether. It is moribund in much of our best prose, and can be allowed to die out of our poetry with no injury to rhyme or reason, strength or beauty.

2. Drop *inflected forms for the past tense and past participle*, making all new verbs, whether introduced from foreign tongues or made within the language itself, conform to the type of *hit*, *let*, etc. In America, in particular, drop *gotten*.

3. Avoid the use of *differing forms for verb and noun*. Follow the model of *boycott*, under 'rule' 2.

4. Avoid the use of *plural forms of nouns*, making all new substantives, whether borrowed from other languages or born of the mother-tongue, conform to the model of *sheep*, *deer*, etc.

5. Avoid the use of *Greek or Latin names for 'new things.'* Follow the good example of certain scientists, and name them after their discoverer, the place of origin, etc. Make new words here conform to the model of *gatling*, *ampere*, and the like.

6. Avoid the use of *feminine forms of nouns* previously employed with reference to males, letting the thought control the grammar. Drop particularly *authoress*, *poetess*, etc.

7. Avoid forming *adverbs by inflection*, using for all new words of this class the same form for adjective (or other word) and adverb.

8. Omit the conjunction *that* wherever possible. For example, in such cases as 'I know *that* he is dead.'

9. Use *but* and *as* as full-fledged prepositions.

10. Drop *whom*, using *who* for both cases.

11. Ceasing the attempt to distinguish between *who* and *that*, and *that* and *which*, let the fittest survive in each instance.

12. Use the pronouns compounded of *self* and their plurals, both as subjects and objects.

13. Drop the *apostrophe* in the *possessive case*.

Other suggestions might be made, but these cover sufficient ground for the present.

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SHORTER ARTICLES.

CATALASE, A NEW ENZYM OF GENERAL OCCURRENCE.

THE study of the enzyms has been pursued with growing interest by a number of scientists during later years. These unorganized ferments being substances of a highly ephemeral

nature, the method of investigating them has departed somewhat from the paths usually followed in determining the composition, effects and rôle, of organic combinations in vegetable and animal organisms. The nature of the enzym is still a matter of much doubt. Of their action we are more sure, and it is along this line that we have become familiar with the nature of some members of this very interesting group of compounds. The rôle of the enzym in the life processes may also in some cases be defined with certitude.

Beginning with a few, the study of unorganized ferments has brought to light many others. Out of the growing number some are already put to important uses, while others bid fair to become of great value to many industries. Dr. Oscar Loew in his studies on tobacco (Rpt. No. 68, Div. of Veg. Phy. and Path. U. S. Dept. of Agr.) goes further in the study of unorganized ferments than ascribing to one a special rôle and shows the general distribution and seeks a reason for its existence of an enzym, to which he gives the name catalase.

In the work with this enzym, in which the writer took some part, the most striking characteristics were its very general dissemination, its persistence, and its ability to break down hydrogen peroxid. In the examination of a large number of animal and vegetable organs this enzym was found present, in greater or less amount, in every instance. Its differentiation from other unorganized ferments is established by a large number o tests with various reagents. Among other characteristics it was found to be more persistent than any other known enzym. This was especially noted in dried vegetable substance as seeds and leaves, being found present in a herbarium specimen of the latter examined after a lapse of over 50 years.

The ability of catalase to break down hydrogen peroxid appeared to be its most striking peculiarity, and this led the author to believe that it might perform such a service in the phenomena displayed by living matter. Tests go to show that it belongs to the class of oxidizing enzyms and its very general occurrence and uniform actions indicate that it plays some important rôle in physiological processes.

From his studies the author gives the following as the most plausible explanations of the action of catalase in vegetable organism: (1) It destroys instantly the hydrogen peroxid, probably formed in cells during the oxidation caused by the respiration process; (2) it loosens chemical affinities in certain compounds so that the protoplasm can more easily split or oxidize them. "In other words, catalase might represent an aid for fermentative as well as for respirative phenonomena." D. W. May.

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TOADS KILLED BY SQUASH-BUGS.

During the past summer the Entomological Department of the New Hampshire College Agricultural Experiment Station carried on investigations on the common squash-bug (*Anasa tristis*), which has been so abundant in some portions of the State the past season. Mr. Kirkland, in Bulletin 46, Mass. Agr. Exp. Sta., recorded the bug to have been found in the stomach contents of toads; Mr. Chittenden, in Bulletin 19, 1899 (New Series), U. S. Dept. Agr., states that Dr. Judd likewise found a bug in a toad's stomach. This suggested that the toad is probably an enemy of the squash-bug, and experiments, made to determine this, showed the following interesting results: When a squash-bug nymph o the fifth stage was suddenly introduced into a half pint, open, wide-mouthed specimen jar containing a half grown live toad, so that the Batrachian would get the full effects of the pungent fumes given off by the bug, the toad was thrown into a temporary stupor, the effect being similar to that of chloroform. As the number of bugs was increased the effect on the toad was increased. When as many as seven bugs were introduced the toad fell into a profound stupor and died in the course of twenty-four hours.

On September 8, an adult, that had been kept in the laboratory vivarium with a scant food supply for several days, was placed in a quart jar of the same construction as the one mentioned above, and eight bugs were introduced; these bugs, however, had been so much disturbed previously that the source of the pungent secretion had been temporarily exhausted. The toad hesitatingly devoured three, after